

New species of *Hybos* from Guangxi, China (Diptera, Empidoidea, Hybotidae)

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New species of *Hybos* from Guangxi, China (Diptera, Empidoidea, Hybotidae). - The following species of *Hybos* from Guangxi (Southern China) are described, illustrated and compared with morphologically similar species: *Hybos liui* sp. n., *H. quadriseta* sp. n., and *H. shuwenae* sp. n. A key to the species of *Hybos* from Guangxi is presented.

Keywords: Diptera - Hybotidae - *Hybos* - new species - key - China.

INTRODUCTION

Hybos Meigen is a cosmopolitan genus which belongs to the subfamily Hybotinae of the family Hybotidae. It is characterized by the following features (terminology after McAlpine, 1981 and Steyskal & Knutson, 1981): anal cell longer than basal cell, Rs rather short, R4+5 and M1 divergent apically and basal cells separated by distinct vein M1+2 (Chvála, 1983). The Oriental region is the most diverse with 37 described species up to the mid eighties (Smith, 1975) and 9 species were known from the Palaearctic region (Chvála & Kovalev, 1989) prior to the extensive studies of the Chinese fauna which started some 20 years ago. Currently 67 species are known to occur in China. They have been mainly described by Yang & Yang (1986, 1987, 1988a, b, 1989, 1991, 1995a, b), Saigusa & Yang (2002) and Yang *et al.* (2002). The major references dealing with *Hybos* in the Old World are Brunetti (1920), Frey (1953), Smith (1965), Saigusa (1963, 1965) and Chvála (1983).

Guangxi belongs to South China with a subtropical and tropical climate. Up to now 14 species of *Hybos* have been described from this region (Yang & Yang, 1986, 1995b). In the present paper, three species are described as new to science, based on the material collected by Ms Shuwen An and Mr Xingyue Liu by sweeping and with a light trap in Maoershan National Nature Reserve in 2003 (25.53°N, 110.25°E, North East of Guangxi). A key to the species of the genus from Guangxi is given.

MATERIAL AND METHODS

The specimens for this study are deposited in the following collections:

CAU = Insect collection of China Agricultural University, Beijing, China

MHNG = Muséum d'histoire naturelle, Genève, Switzerland

The following abbreviations are used: acr = acrostichal, ad = anterodorsal, av = anteroventral, dc = dorsocentral, h = humeral, oc = ocellar, npl = notopleural, pd = posterodorsal, presc = prescutellar, psa = postalar, pv = posteroventral, v = ventral.

KEY TO SPECIES OF *HYBOS* FROM GUANGXI (SOUTHERN CHINA) (MALES ONLY)

- 1 Femora chiefly yellow, at most hind femur partly or entirely black 2
- 1* Femora black, at most apex of hind femur yellow 6
- 2 Hind femur entirely yellow 3
- 2* Hind femur partly or entirely black 4
- 3 Arista bare; scutellum black. Guangxi *H. nasutus* Yang & Yang, 1986
- 3* Arista pubescent; scutellum yellow. Guangxi, Zhejiang
. *H. flaviscutellum* Yang & Yang, 1986
- 4 Hind femur partly black 5
- 4* Hind femur entirely black. Guangxi, Guizhou, Zhejiang, Fujian . *H. chinensis* Frey, 1953
- 5 Hind femur tinged with black on apico-dorsal surface. Guangxi, Fujian, Henan
. *H. orientalis* Yang & Yang, 1986
- 5* Hind femur tinged with black on dorsal surface. Guangxi
. *H. guangxiensis* Yang & Yang, 1986
- 6 Apex of hind femur yellow; arista bare 7
- 6* Hind femur black 8
- 7 Mid tibia yellow. Guangxi, Fujian *H. longshengensis* Yang & Yang, 1986
- 7* Mid tibia black. Guangxi, Guizhou, Fujian. *H. ancistroides* Yang & Yang, 1986
- 8 All tibiae entirely black 9
- 8* Tibiae partly yellow. Guangxi, Guizhou *H. basiflavus* Yang & Yang, 1986
- 9 First flagellomere black 10
- 9* First flagellomere yellow; fore and mid tarsi yellow. Guangxi
. *H. acutatus* Yang & Yang, 1986
- 10 Hind tibia medially with 1-2 ad 11
- 10* Hind tibia medially without ad 12
- 11 Hind tibia with 1 ad. Guangxi *H. liui* sp. n.
- 11* Hind tibia with 2 ad. Guangxi, Sichuan, Guizhou, Henan
. *H. ensatus* Yang & Yang, 1986
- 12 Hypandrium not truncate apically 13
- 12* Hypandrium truncate apically. Guangxi *H. truncatus* Yang & Yang, 1986
- 13 Arista with swollen tip (Fig. 12). Guangxi *H. shuwenae* sp. n.
- 13* Arista evenly thin at tip 14
- 14 Arista short pubescent (rays about as long as basal diameter of arista) 15
- 14 Arista bare. Guangxi *H. maershanus* Yang & Yang, 1995
- 15 Fore tibia without v or pv, mid tibia without apical av. Guangxi
. *H. starki* Yang & Yang, 1995
- 15* Fore tibia either with 3 very long v or 3 long pv; mid tibia with 1 apical v 16
- 16 Fore tibia with 3 very long v. Guangxi *H. jinxiuensis* Yang & Yang, 1986
- 16* Fore tibia with 3 long pv. Guangxi *H. quadriseta* sp. n.

DESCRIPTIONS OF NEW SPECIES

Hybos liui sp. n.

Figs 1-6

MATERIAL

Holotype male, Guangxi: Maoershan National Nature Reserve, Huajiang (350 m), 27. VI. 2003, Xingyue Liu (CAU).

ETYMOLOGY

The species is named after the collector Mr Xingyue Liu.

DIAGNOSIS

Wing slightly grayish. Legs entirely black. Hind tibia with 1 weak ad medially.

DESCRIPTION (MALE)

Measurements: Body length 4.2 mm, wing length 3.7 mm.

Head: black, pale gray microtrichose. Eyes dark brown, enlarged upper facets brownish yellow, contiguous on frons for a long distance which is 3.0 times the length of the first flagellomere. Setae and setulae black; ocellar tubercle distinct, with one pair of long oc and 2 very short posterior setulae. Antenna black; scape without setulae; pedicel with a circle of subapical setulae; first flagellomere black without dorsal setulae; arista black, short pubescent except apical third bare. Proboscis black; palpus black with 1 long ventral setula apically.

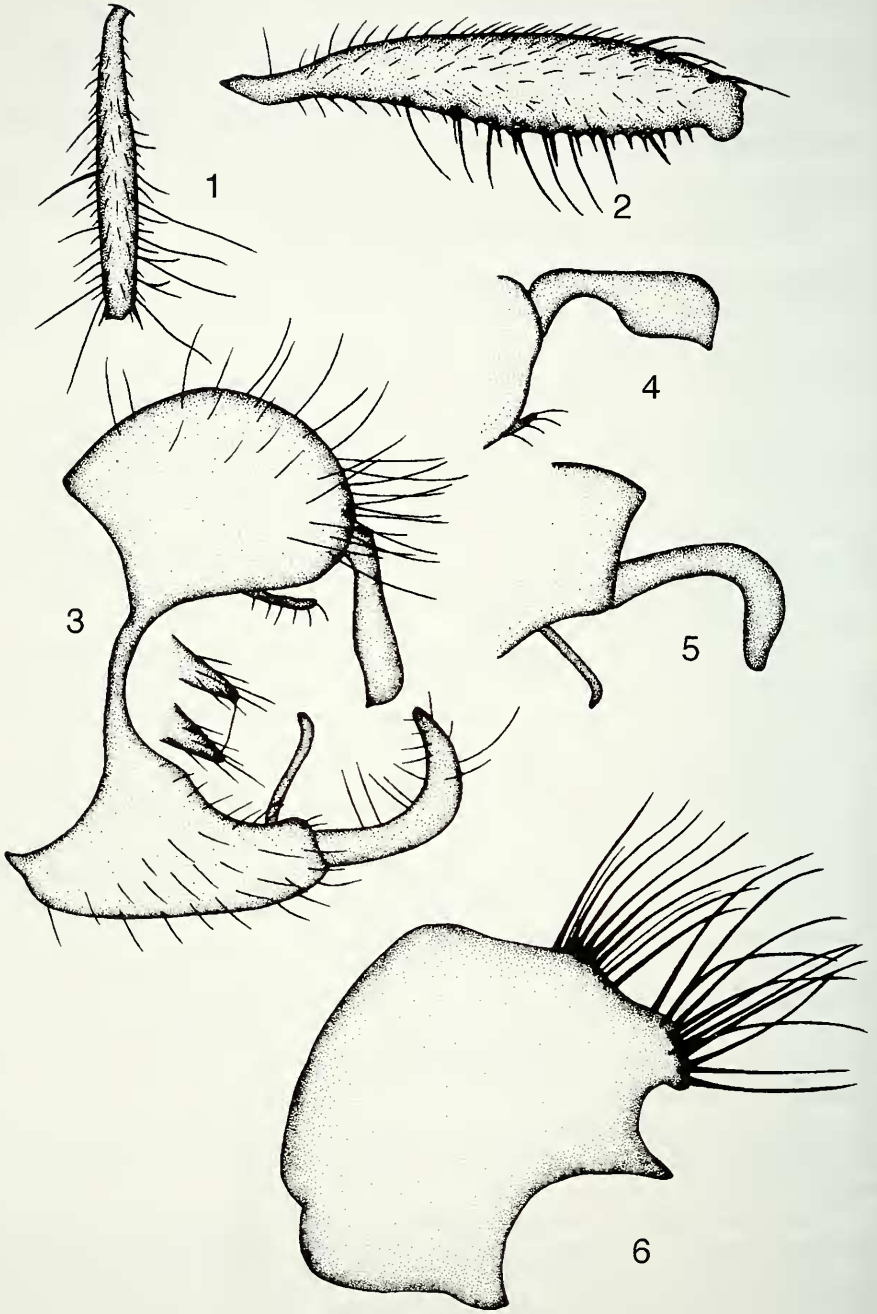
Thorax: black, pale grey microtrichose. Setae and setulae black; postpronotal lobe with black setulae; h absent, 2 npl (anterior npl short), acr in 6 more or less regular rows; dc in one row: 1 long posterior dc, 10 setulae anterior; 1 long presc, 1 long psa; scutellum with 8 marginal setulae and 2 long subapical setae.

Legs: entirely black, with black setae and setulae; fore and mid tibiae, first and second tarsomeres (except mid second tarsomere) with rather long setulae. Fore femur 1.25 times as wide as mid femur, with a row of long setulae-like pv; mid femur with some long setulae-like ad and one row of dense very long setulae-like pv; hind femur (Fig. 2) 2.1 times as wide as mid femur, with 3 preapical dorsal setae, and with about 3 rows of ventral spines located on weak tubercles, those of the av row (except 2 apical ones) are rather long and seta-like. Fore tibia (Fig. 1) with 1 ad at middle, 1 very short av and 1 very short pv apically; mid tibia with 2 ad medially, and 1 very long av apically; hind tibia with 1 weak ad at middle and with 1 long preapical pd. First mid tarsomere with 1 long ad in basal third and with 1 long ad at tip. First and second hind tarsomeres with short, strong v.

Wing: slightly tinged with grayish; veins dark brown; stigma longer than half the length of r1 along costa, dark brown. Squama dark yellow, bordered with pale setulae. Halter brown.

Abdomen: slightly curved downward, black, grey microtrichose. Setulae black. Male genitalia (Figs 3-6): left tergal lobe with long finger-like inner process, left surstylus hook-like; right tergal lobe with two short finger-like marginal processes, right surstylus curved medially with nearly straight dorsal margin; hypandrium rather wide, nearly as wide as long, distinctly incised apically, with two groups of dense long lateral setae.

Female. Unknown.



FIGS 1-6

Hybos liui sp. n. (male, holotype). 1, fore tibia, posterior view; 2, hind femur, anterior view; 3, genitalia, dorsal view; 4, right surstylus; 5, left surstylus; 6, hypandrium, ventral view.

DISTRIBUTION

China (Guangxi).

REMARKS

The new species is somewhat similar to *Hybos maoershanus* Yang & Yang from Guangxi by the rather short hypandrium. *H. liui* can be easily separated from the latter by the hind tibia with 1 ad at middle and pubescent arista. In *H. maoershanus*, the hind tibia has no ad at middle, and the arista is bare (Yang & Yang, 1995b).

Hybos quadriseta sp. n.

Figs 7-11

MATERIAL

Holotype male, Guangxi: Maoershan National Nature Reserve, Antangping (1600 m), light trap, 1. VII. 2003, Shuwen An (CAU). Paratypes 2 males, Guangxi: Maoershan National Nature Reserve, near Antangping (1100-1600 m), 1. VII. 2003, Xingyue Liu (CAU & MHNG).

ETYMOLOGY

The species is named after the hypandrium with 4 long setae. The name is a feminine noun in apposition.

DIAGNOSIS

Wing hyaline with indistinct stigma; legs and antennae entirely black. Mid femur rather thin; mid tibia with one very long basal ad and a very long apical av; male genitalia characteristic with bifurcated hypandrium bearing 4 long, black setae (Fig. 11).

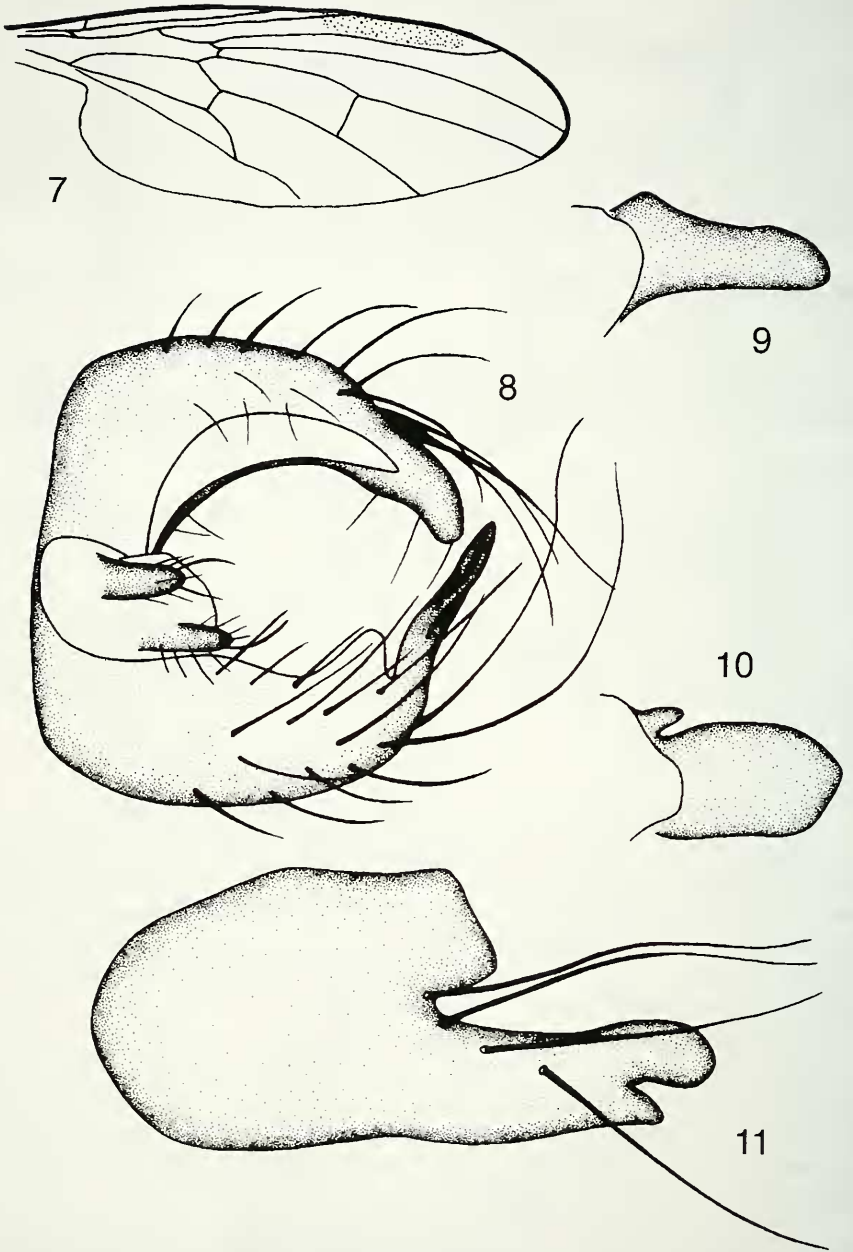
DESCRIPTION (MALE)

Measurements: Body length 2.9-3.0 mm, wing length 3.3-3.4 mm.

Head: black, pale gray microtrichose. Eyes dark brown but enlarged upper facets dark yellow; contiguous on frons for a long distance more than 2.5 times the length of the first flagellomere. Setae and setulae black; ocellar tubercle distinct, with a pair of long oc and 2 very short posterior setulae. Antenna black; scape without setulae; pedicel with a circle of apical setulae; first flagellomere with or without dorsal setula at apex; arista black, short pubescent except for thin and bare apical quarter. Proboscis black; palpus black with 2 long ventral setulae.

Thorax: subshiny black, thin pale gray microtrichose. Setae and setulae black; postpronotal lobe with 2 short, pale setulae, 2 npl (anterior npl short), acr setulae-like, in 4 more or less regular rows; dc in one row: 1 long posterior dc, 6 setulae anterior; 1 psa; scutellum with 3 pairs of marginal setae, the subapical pair much longer and stronger than the basal and apical pairs.

Legs: entirely black. Setae and setulae black. Fore femur 1.3 times as wide as mid femur; mid femur rather thin; hind femur distinctly swollen, 2.1 times as wide as mid femur, without preapical setae, and with 3 rows of v (4 rather long spine-like av, very short spine-like v located on weak tubercles, pv long, setulae-like). Fore and mid femur with a row of long setulae-like pv (longer than femur width). Fore tibia with 3 long pv of increasing length on apical quarter, 1 long ad and 2 short av apically; mid



FIGS 7-11

Hybos quadriseta sp. n. (male, holotype). 7, wing; 8, genitalia, dorsal view; 9, right surstylus; 10, left surstylus; 11, hypandrium, ventral view.

tibia with 1 very long ad at basal third longer than half the length of the tibia, 1 very long av apically (more than half as long as mid basitarsus) and 1 short pv; hind tibia with 1 short av apically. First fore tarsomere with 2 long pv on basal third. First mid tarsomere with 1 short, strong v at extreme base. First and second hind tarsomeres with short, strong v.

Wing: hyaline; veins brown; stigma longer than half the length of r1 along costa, indistinctly brownish (Fig. 7). Squama yellow with pale hairs along margin. Halter dark yellow with dark brown base.

Abdomen curved downward, blackish, grey microtrichose. Setulae long, pale. Male genitalia (Figs 8-11): Left tergal lobe with inner margin weakly convex medially, left surstylus rather wide with small acute lateral process; right tergal lobe with a distinct inner incision, right surstylus slightly narrowing towards tip; hypandrium much longer than wide, with elongated lateral portion apically furcated into large obtuse process and small acute process, and with 4 long setae.

Female. Unknown.

DISTRIBUTION

China (Guangxi).

REMARKS

The new species is somewhat similar to *Hybos apicichamatus* Yang & Yang from Zhejiang, but may be separated from this species by the presence of 1 very long ad on the mid tibia and the absence of an apico-lateral hook on the hypandrium (see also Yang & Yang, 1995a).

Hybos shuwenae sp. n.

Figs 12-20

MATERIAL

Holotype male, Guangxi: Maoershan National Nature Reserve, Hongjunting, 1600 m, light trap, 28. VI. 2003, Shuwen An (CAU). Paratypes 1 female with same data (CAU); 1 male, Guangxi: Maoershan National Nature Reserve, 1100-1600 m, 1. VII. 2003, Xingyue Liu (MHNG).

ETYMOLOGY

The species is named after the collector Ms Shuwen An.

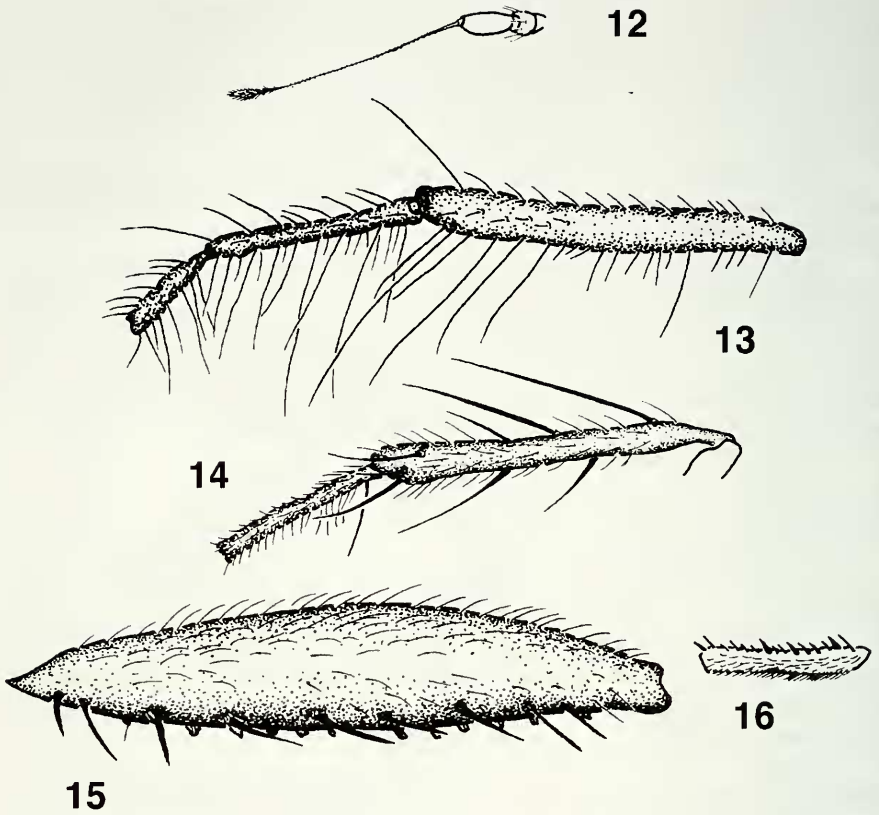
DIAGNOSIS

Male: Arista with swollen tip bearing short pubescence (Fig. 12). Antenna and legs black, only very base of hind tibia narrowly yellow; male genitalia characteristic with both surstyli and hypandrium bilobated (Figs 17-20).

DESCRIPTION

MALE. *Measurements*: Body length 4.7-5.3 mm, wing length 4.3-5.0 mm.

Head: black, pale gray microtrichose. Eyes dark brown with enlarged upper facets reddish yellow, contiguous on frons for a distance about twice as long as first flagellomere. Setae and setulae black; ocellar tubercle distinct, with one pair of long oc and 2 short to long posterior setulae. Antenna black; scape without setulae; pedicel with a circle of apical setulae; first flagellomere without dorsal setula; arista black,



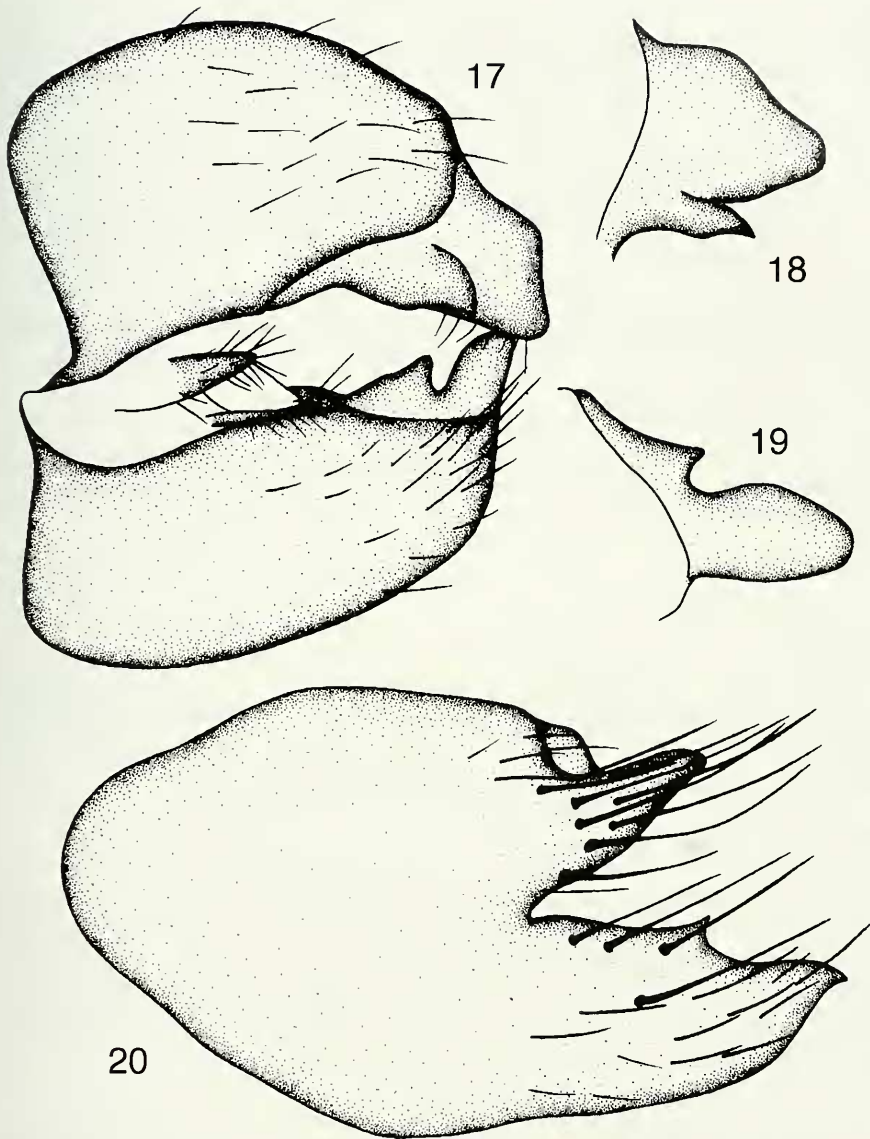
FIGS 12-16

Hybos shuwenae sp. n. (male, paratype). 12, antenna; 13, fore tibia and first and second tarsomeres, posterior view; 14, mid tibia and mid first tarsomere, posterior view; 15, hind femur, anterior view; 16, hind first tarsomere, anterior view.

short pubescent, with swollen tip bearing short pubescence (Fig. 12). Proboscis blackish; palpus blackish with 4-5 long ventral setulae.

Thorax: black, pale gray microtrichose. Setae and setulae black; h absent, but with a row of about 4 upright soft setulae, 2 npl (anterior npl very short), acr setulae-like, in 6-rows; dc in one row: 1 long posterior dc, 6 setulae anterior; 1 psa; scutellum with 3 pairs of small, soft setulae and a pair of strong, long subapical setae.

Legs: black, but base of hind tibia narrowly yellow. Setae and setulae black. Fore femur 1.1 times as thick as mid femur; hind femur swollen, 2.2 times as thick as mid femur; hind femur with 2 ad setae on apical two third, with an entire row of strong and long av on tubercles, a row of short v on tubercles and some pv on smaller tubercles in basal third; pv soft, much longer than diameter of femur in apical two third (Fig. 15). Fore and mid femora with a row of short setulae-like av about as long as diameter of tibia, and with a row of long setulae-like pv much longer than diameter of femur. Fore tibia (Fig. 13) with long pv on apical third of increasing length, the longest



FIGS 17-20

Hybos shuwenae sp. n. (male, holotype). 17, genitalia, dorsal view; 18, right surstylus; 19, left surstylus; 20, hypandrium, ventral view.

about half as long as the tibia length, with an apical ring of 1 long ad, d and av; mid tibia (Fig. 14) with 2 very long ad on basal half longer than half length of tibia, 2 av medially (the longer almost half as long as tibia length), apically 1 weak ad, 4 strong v and 1 very long av almost as long as mid basitarsus; hind tibia with an entire row of weak, soft pd about as long as diameter of tibia, without distinct setae apically. First

and second fore tarsomeres (Fig. 13) with entire rows of long sparse ad and pv, the longest setulae almost as long as first basitarsus length; The fore first tarsomere with 1 ventral spine-like v at extreme base; first mid tarsomere with a soft, long v at base almost half as long as length of tarsomere; First and second hind tarsomeres with short ventral spines (Fig. 16).

Wing: hyaline; veins dark brown; stigma brownish, long, extending from R1 to R2+3. Squama yellow with pale hairs along margin. Halter yellow.

Abdomen curved downward, black, gray microtrichose. Setulae black or pale. Male genitalia (Figs 17-20): Left tergal lobe with inner margin slightly convex medially, left surstylus wide basally with small acute lateral process; right tergal lobe with inner margin weakly incised, right surstylus rather wide basally with small acute lateral process; hypandrium longer than wide, distinctly furcated apically, 4 long setae on ventral branch.

FEMALE. Body length 5.0 mm, wing length 4.7 mm. Similar to male, but oc with distinctly longer posterior setulae; arista normal with very short tip which is bare and evenly thin; fore and mid tibiae and tarsomeres 1-2 without posterior setulae; hind femur with 1 preapical setae.

DISTRIBUTION

China (Guangxi).

REMARKS

The new species shares with *Hybos starki* Yang & Yang from Guangxi the furcated hypandrium, differing from the latter by the swollen tip of the distinctly pubescent arista and mid tibia with 2 av. In *H. starki*, the arista is not swollen apically and its tip is bare, and the mid tibia has no av (Yang & Yang, 1995b).

CONCLUSIONS

Including the present study 17 species of *Hybos* are known to occur in Guangxi. Among them 10 species are so far endemic to the province, 3 species are distributed also in other parts of Southern China, and 4 species are also recorded from provinces in Central China. Obviously, the fauna of *Hybos* in Guangxi has close relationships to other parts of Southern and Central China and differs strongly from the fauna in Northern and Western China.

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